AMENDMENTS TO THE CLAIMS

Kindly cancel claims **1-4**, **6**, **7**, **11** and **17**, amend claims **5**, **8**, **10**, **12** and **13** and add new claims **19**, **20**, **21** and **22**. This listing of claims will replace all prior versions, and listings of claims in the application.

LISITING OF CLAIMS

Claims 1-4 (canceled).

Claim 5 (currently amended). ~~The parallel plate diode according to claim 2,~~ A parallel plate diode, comprising:
two thin plate metal electrodes and a semiconductor material layer contacting said metal electrodes, wherein the two thin plate metal electrodes are disposed in parallel, wherein the semiconductor material layer is sandwiched between the two thin plate electrodes, wherein the concentration of the carriers in the semiconductor material layer is 20% or less than that of the electrons in the metal, one of the metal electrodes is made so as to have a plurality of recesses from its surface into the interior on the side that faces the semiconductor material layer, wherein the diameter of those recesses is less than 4 micrometers,
wherein said recesses are well-shape cavities,
wherein [[said]] a cross section of the well-shape cavity is in the form of an array of convex portions and concave portions.

Claim 6. (canceled)

Claim 7 (canceled)

Claim 8. (currently amended) The parallel plate diode according to claim [[1]] 5, wherein said parallel plate diode is attached to an insulated substrate.

Claim 9. (original) The parallel plate diode according to claim 8, wherein said parallel plate diode is attached to a glass substrate.

Claim 10. (currently amended) The parallel plate diode according to claim 9, wherein the metal electrode having the well-shape cavity of [[each]] the diode is coupled to a germanium electrode of an adjoining diode having the same structure, thus forming a parallel plate diode in series structure.

Claim 11 (canceled).

Claim 12 (currently amended). ~~The parallel plate diode according to claim 11~~, A parallel plate diode, comprising:
two thin plate metal electrodes and a semiconductor material layer contacting said metal electrodes, wherein the two thin plate metal electrodes are disposed in parallel, wherein the semiconductor material layer is sandwiched between the two thin plate electrodes, wherein the concentration of the carriers in the semiconductor material layer is 20% or less than that of the electrons in the metal, one of the metal electrodes is made so as to have a plurality of recesses from its surface into the interior on the side that faces the semiconductor material layer, wherein the diameter of those recesses is less than 4 micrometers,
wherein said each of the metal electrodes has one or more well-shape cavities, the well-shape cavities of the two electrodes having identical structures so that they can be joined together to form a parallel plate diode in series.

Claim 13 (currently amended). ~~The parallel plate diode according to claim 1,~~ A parallel plate diode, comprising:

two thin plate metal electrodes and a semiconductor material layer contacting said metal electrodes, wherein the two thin plate metal electrodes are disposed in parallel, wherein the semiconductor material layer is sandwiched between the two thin plate electrodes, wherein the concentration of the carriers in the semiconductor material layer is 20% or less than that of the electrons in the metal, one of the metal electrodes is made so as to have a plurality of recesses from its surface into the interior on the side that faces the semiconductor material layer, wherein the diameter of those recesses is less than 4 micrometers,

wherein there are recesses on the surfaces wherein the two metal electrodes that make up the parallel plate diode contact the semiconductor material, and wherein the average diameter of the recesses on one side of the semiconductor material is equal to or smaller than 0.7 micrometer while the average diameter of the recesses on the other side is bigger than 0.7 micrometer.

Claim 14 (previously presented). The parallel plate diode according to claim 13, wherein the surface of the two electrodes have recesses with different depths.

Claim 15. (original) The parallel plate diode according to claim 13, wherein said the surface of the two electrodes have recesses with different shape.

Claim 16-18 (canceled)

Claim 19 (new). The parallel plate diode according to claim 5, wherein said cross section of the well-shape cavity is a circular, a square, rectangle or an irregular curve.

Claim 20. (new) The parallel plate diode according to claim 5, wherein said cross section of the well-shape cavity is groove-shape.

Claim 21. (new) The parallel plate diode according to claim 5, 19, or 20, wherein two walls of the well-shape cavity or groove-shape are made of two substances, $e\Phi 1$ and $e\Phi 3$ respectively represent the power function of two walls of the well cavity, they satisfy the following relation:

$$\Phi_1 < \Phi_3.$$

Claim 22 (new) The parallel plate diode according to claim 5, 12 or 13, wherein one or more of said metal electrodes is made from an alloy of iron, nickel and cobalt having a thermal expansion coefficient of about $3X10^{-6}$.